

Attachment 2

Appalachian Power Company's Smith Mountain Project Summary of Public Comments and DEQ Response Draft Virginia Water Protection Permit No. 08-0572

Executive Summary:

Commenters were generally divided into those in favor of maintaining higher lake levels in Smith Mountain Lake (SML) and those in favor of preserving minimum instream flows in the Staunton River. The Department of Environmental Quality (DEQ) received 460 emails and letters in favor of higher lake levels and 138 emails and letters in favor of preserving minimum instream flows. Speakers at the public hearing were evenly divided and no different views to those received in writing were expressed

The most frequently mentioned comments of those desiring higher lake levels were as follows:

- SML was designed to be operated at 795 feet above sea level with only a two foot fluctuation.
- The draft permit will cause low lake levels and diminish property values.
- DEQ should participate in another meeting of upstream and downstream stakeholders in an attempt to forge a compromise that all can support.
- Public Safety is compromised at low lake levels because the Marine Fire Department has difficulty responding to calls. Public safety is also compromised by groundings due to low lake levels.
- Boating access is lost when the reservoir water level drops.
- DEQ did not take into account public water supply.
- Inflow should equal outflow during a drought.
- SML is an important economic asset to the region and low lake levels reduce economic activity.
- DEQ should adopt the Tri County Relicensing Committee (TCRC) position (consists of revised release protocol that keeps more water in the lake at expense of downstream flows).
- DEQ should make APCO pump back water from Leesville Lake more consistently.
- DEQ should make APCO open a canal and provide new boat launches downstream.

The most frequently mentioned comments of those in favor of preserving downstream minimum flows were:

- HL-8 is based on science and the input from professionals of the natural resources agencies.
- HL-8 does what the law requires by protecting and balancing instream beneficial uses with off stream uses.
- Boating continues on the lake at all levels anticipated by HL-8, whereas river boating stops at flows below 800 cfs; canoeing is not possible at the low flows of HL-8.
- DEQ should support the five Staunton River Watch recommendations, i.e. continuous release, fix a typographical error, reduce the trigger elevation for trigger 2, provide for recreation releases even if the lake does not refill in the spring and provide summer holiday recreation releases.

- HL-8 results in higher lake elevations than previous release protocols and lower minimum releases so the downstream community is losing water under the proposed permit compared with the old license.
- SML enjoys much less fluctuation than many other large lakes.
- Groundings occur at all levels and can be avoided by competent mariners, which should include the marine fire department.
- Run of the river is not an appropriate release at low flow, due to the damage caused by the project, guaranteed minimum flows should be provided.

Part I. Most Frequently Mentioned Upstream Comments

Comment: SML was designed to maintain a full pond of 795 feet with a two foot fluctuation due to releases to Leesville Lake. These releases would then be pumped to SML restoring the upper lake elevation to 795 feet.

Response: This is a common misconception among some property owners around SML, i.e. they say that the constant water level at Smith Mountain Lake was a major factor in purchasing a waterfront property a few years ago. The record indicates that SML was not designed and has not always stayed at 795 feet with only two feet of fluctuation. The project was first full in 1966. The total decline in lake elevation in any year depends on the severity of the low flows in that year. According to the APCO website the minimum lake level of 787.7 feet occurred on January 23, 1970. In 44 years of operation, lake levels have fallen below 792 feet in all but 7 years and below 791 feet in 23 years. Based on the lake's history, in a typical year the lake falls 4.2 feet, to elevation 790.8 feet.

The Project is required by its FERC license to maintain a minimum release of 650 cubic feet per second (cfs) from Leesville Dam. When inflow into the project exceeds the minimum release of 650 cfs plus any losses to withdrawals, evaporation and seepage, the lake will stay full and fluctuate no more than two feet. This condition generally prevails in the winter and spring. Stream flow declines in the summer, usually to the point at which inflow into the Project is less than outflow. Outflows include the minimum required release of 650 cfs, evaporation from the lake, seepage from the Project and water withdrawals. When outflow exceeds inflow the lake level declines. This situation generally prevails from mid June until late fall, at which time higher inflows refill the lake.

Variances to the minimum release requirement were issued in 1980, 1981, 1998 and 1999. These variances stopped the lake from dropping even more precipitously. The reasons given by APCO for seeking these early variances were that navigation was impaired at elevation 787 and APCO wished to avoid that situation. Tree tops that were left uncut in the lake would be five feet below the water surface when the lake drops to 787 feet and could impede navigation. The ability to generate power has never been compromised because the intakes to the turbines are 50 feet below the surface.

In 2000, APCO's FERC license was amended so that DEQ could grant a variance to the original 650 cfs minimum release requirement in a more timely fashion in response to drought conditions. Under amended Article 29, variances to the 650 cfs minimum release have been granted in 2000, 2001, 2002, 2007 and 2008. If variances had not been obtained by APCO in the serious drought of 2002, the lake would have fallen 16 feet.

In summary, the comment that the lake is supposed to stay full and not fall by more than two feet is not supported in fact...

Comment: DEQ's permit will cause lower lake levels, which in turn will diminish property values.

Response: If one accepts historical conditions as a baseline, the draft permit cannot negatively impacts future property values because it increases lake levels over historical conditions. Property values have actually increased in spite of the recent spate of dry years and low lake levels. Franklin County reassesses property every 4 years. Overall, assessments in Franklin County increased 55% in 2008. Reassessments in the Gills Creek and Union Hall districts, (the districts with most of the lakefront property) increased more rapidly at 72% and 65% respectively. Minimum lake levels in the previous four years were 789.57 in 2007, 791.47 in 2006, 791.85 in 2005 and 793.1 in 2004. Property values appear to have risen despite the fact that 3 out of the past 4 years had very low lake levels.

Comment: DEQ should participate in another meeting of upstream and downstream stakeholders to forge a compromise that all can support.

Response: DEQ participated in such a meeting between upstream and downstream stakeholders on September 5, 2008, organized by the Virginia Roanoke River Basin Advisory Committee. Representatives of the Tri County Relicensing Committee (TCRC) provided a summary and explanation of their new proposal (a revised release protocol that they had submitted during the comment period) to the group. Although the downstream stakeholders were not given an opportunity to review the revised model runs prior to the meeting, they took the position that the model that was used by APCO in their application, and which DEQ used to draft the permit, makes them already much worse off in terms of minimum flow compared to the original license and also worse off compared to more recent variance procedures. Therefore they are not supportive of TCRC proposals that would give them even less water during droughts. APCO objected to the meeting because it was outside the normal agency procedures and because the TCRC proposal did not make use of the risk based decision making matrix that had previously been accepted by all parties as the proper general approach. No compromise resulted from the meeting.

Comment: Public Safety is compromised at low lake levels because the Marine Fire Department has difficulty responding to calls. Public safety is also compromised by groundings due to shallow water.

Response: The Marine Fire Department's comments are presented in Appendix 1, and include descriptions of the measures that the Marine Fire Department takes and problems they encounter as the lake level falls. Representatives of the Marine Fire Department attended at least two of the drought management work group meetings and described the measures that they took and the difficulties they face when the lake is less than full. Some of the measures involved moving boats to deeper berths to maintain access, using caution when operating on the main lake to avoid shoals, carrying extra equipment such as step ladders and having to stop not at the dock of choice but at an adjacent dock and walking along shore when responding to a call. Given the description of the problems, and the measures that the Marine Fire Department takes to cope, there does not appear to be definitive elevation at which fire boat operations cease or become untenable.

In the workgroup meetings the question was posed, “What happens if a fire was too far away from the water for a fireboat to reach?” The fireboats generally carry 1000 to 1200 feet of hose. In these cases the fireboats work as pumping platforms, but they must work in conjunction with a fire truck. They pump water from the lake to the trucks which can either reach the fire with a hose or must shuttle water in a tank truck to the fire.

In an email dated May 9, 2008, Teresa Rogers of APCO asked the chief of the Marine Fire Department, “Can you also please provide me with a summary of past fire responses on the lake (date, time and location) and note any fires that could not be reached due to water levels and “If there are any other types of incidents on the lake in which the Marine Fire/Rescue could not respond to due to lower water levels that I need to be aware of, please provide the date/time and location of these as well.” No response was received by APCO to this email or to a follow up email sent by APCO on July 28, 2008.

We have one photograph of a grounded fireboat dated October 31, 2001. The fireboat was returning to its dock at night. The grounding took place about 15 feet from shore and close to the home marina of the fireboat, where the operator should have had familiarity with the shoal. We were also sent a newspaper article from the Smith Mountain Eagle which described how a fireboat had to stop at a neighboring dock due to low water in response to a call about a person who had fallen and broken their arm. We do not have any other specific examples of problems caused by low lake levels in responding to calls.

In an email from APCO to DEQ dated May 13, 2008, Teresa Rogers wrote, “The Smith Mountain Marine Fire / Rescue was formed in 1974. A problem with responding to fires as a result of lake levels has not been an issue that was ever brought up to Appalachian prior to relicensing. Based on historic record, Appalachian is not proposing any changes under its new license that will cause future levels to be lower than those under which the lake has developed over the last 40+ years. One reason that we believe that this is coming up as an issue now, besides the desire to keep the lake full, is because the Fire and Rescue became ISO rated in 1987 which results in reduced insurance premiums for lake residents. At no time has Appalachian indicated that levels would be maintained in order to guarantee that the fire boat can operate in any given area.”

Remarking on public safety in their written comments, DGIF said, “Finally, Smith Mountain Lake is one of the deepest lakes in Virginia and in most areas the shoreline drops off rather quickly and emergency service access is relatively easy in most areas despite what the water level may be on any given day. However, there may be some lots that are not easily accessed at any water level. Each individual is responsible for conducting their (sic) own personal risk assessment regarding emergency service access when they are weighing whether to buy a piece of property to build a house on or not. This is the case not only at Smith Mountain Lake, but in many areas across the Commonwealth where individuals decide to build their (sic) homes in remote areas where emergency service access is difficult at best or perhaps not available at all; it is a personal risk decision for each individual.”

APCO provided DEQ with fifty aerial photographs that covered the entire Smith Mountain Lake shoreline. The 800 foot, the 795 foot and the 782 foot contours were superimposed on the photographs. The 782 foot contour would represent 13 feet deep water at full pond. The aerial photographs generally show, as DGIF commented, that deep water occurs a short distance off most of the shoreline.

DGIF maintains a data base on boating accidents. DEQ examined this data base early in the process looking at the 2001 to 2006 data and concluded that about half of the reported accidents involved collisions, about a quarter of the accidents involved injuries related to towed water sports which are unrelated to water levels. About 10% of the accidents involved groundings. About 80% of all accidents occurred in the three summer months.

DGIF examined the 2001 to 2007 record, focused on the grounding incidents and said the following: “During the period from 2001 to 2007 there were 183 boating accidents on Smith Mountain Lake and 18 of the accidents were classified as “groundings” or “hit shoal”. This would indicate that approximately 10% of all accidents were groundings, however a few of these groundings were alcohol related and would likely have happened no matter what level the lake was at. Listed below are the dates of all grounding incidents on Smith Mountain Lake from 2001-2007 and the minimum lake elevation for that day. A quick review of the data indicates that 7 incidents occurred while the lake was below 792 feet and 11 incidents occurred when the lake was above 792 feet.”

DATE	MINIMUM LAKE ELEVATION
6/17/01	794.00
7/1/01	793.35
8/19/01	792.25
8/29/01	791.49
12/26/01	789.94
7/4/02	791.98
7/6/02	791.32
8/10/02	790.65
8/13/02	790.88
8/28/03	793.49
5/31/04	794.85
7/17/05	794.14 -2 groundings
5/13/06	793.64
7/27/06	793.42
8/27/06	792.15 – 2 groundings
10/7/07	790.59

At the public hearing, there was considerable testimony concerning public safety, with commenters from downstream asserting that groundings and other accidents on the lake are not necessarily related to water level but are the result of other factors including speed, lack of good judgment and alcohol use. River supporters who boat on the lake said that the lake is always navigable and groundings are avoidable with common sense even at low lake levels. Lake supporters assured us that groundings, as most people would suspect, increase when lake levels drop, particularly since so many inexperienced tourists use the lake. DEQ believes that both sides make good points.

In summary, DEQ thinks that the draft permit, which changes the license from the current 650 cfs minimum release, will result in improvements for the Fire Department. The lack of a well documented problem and the bathymetric evidence to the contrary causes us, like APCO, to suspect that the public safety issue has come to the forefront during relicensing, not because there is a serious problem, but because it fits with the overall desire of the upstream stakeholders

to keep the lake full. The claim that low lake levels have jeopardized public safety in the past is not supported by the record and should not trump the other objectives that the SWCB must consider.

Comment: Boating access is lost when the lake level declines.

Response: Boating access is reduced as the lake levels declines. However, boating on the lake continues despite the temporary declines in lake levels due to the fact that individual access varies. In a personal communication, Lt. Karl Martin of DGIF estimated that thousands of boats were on the SML each day over the Labor Day weekend, in spite of the low lake levels. Very nice weather played a part in the large turnout. Lt. Martin did note that night time boating has been noticeably curtailed due to people heeding warnings about low lake levels. Lt. Martin also noted that the large fast power boats are not as active this season, probably because of fuel prices. The lake was down below 793 feet adjusted for much of the summer of 2008.

The extent to which any boat slip or ramp loses boating access will depend on a number of factors including the amount of decline in water levels, the type of boat, the length of the pier and the depth of the water just offshore. DEQ has not quantified how many boat slips remain serviceable at each water level. Even very small declines in lake levels will cause access to be lost at shallow water lots in the backs of coves. Conversely, there are also docks in deep water that do not ever lose boating access over the range of lake levels experienced at SML.

DEQ will be presenting to the SWCB aerial photographs of the SML shoreline with the 800 foot, the 795 foot and the 782 foot contours superimposed. The photographs will generally show that deep water occurs a short distance off most of the shoreline. The horizontal distance between the 800 foot contour and the 782 foot contour is frequently less than 100 feet. Sloping land this steep means that some landowners can access deep water with extremely short piers.

Building a pier to deeper water or dredging to depth 789 are two methods available to shoreline property owners who want to improve their boating access. According to the littoral study, 1316 new docks were built between 2005 and 2006. The shoreline management plan allows both dredging and dock building, with some restrictions. According to the littoral study, there is a small and inconsistent record for dredging projects. Between the years 2000 and 2006, only 32 dredging projects excavating between 25 and 3000 cubic yards took place

The shoreline management plan allows docks of 100 feet long or 1/3 the width of a cove whichever is less. The shoreline management plan also includes variance procedures. A variance application for a small communal pier with three slips and 500 cubic yards of dredging is pending before APCO and FERC presently, by the owners of three lots in the back of a shallow cove. Although the Project requires a variance from the Shoreline Management plan we see no reason why the permit will not be granted due to the fact that the applicant has minimized the impacts.

DEQ agrees that boating access on SML is one of the factors that should be taken into consideration by the SWCB. However, DEQ does not agree that this use has priority over all other uses. Under HL-8, SML will be above 793 feet adjusted 87% of the time, which should give most water front property owners boating access most of the time.

Comment: DEQ did not take into account public water supply.

Response: The permit is being issued to APCO for their hydroelectric turbine and pump discharges, not for a water supply withdrawal. Water supply withdrawals must make their own applications, and get their own individual permits which will be considered on a case by case basis once the application is received. All future applications will be considered on their own merits.

TCRC says, “The fact that HL-8 doesn’t model the higher withdrawal limit means that localities will have to finance additional studies before applying to FERC and VA DEQ for any increased withdrawal above 12.5 mgd”. Hydrologics did model higher water withdrawals so estimates of the impacts of higher withdrawals on lake levels, should they materialize, should be known. Although we can not predict what will be required by FERC several years from now, DEQ requires the same information for all public water supplies from surface water. Although FERC will probably issue a license with a 40 year term, the SWCB, by law can only issue a permit for 15 years. Speculation about water demand projections 16 to 40 years from now are not warranted at this time, particularly when the locality’s State required water supply plans have been neither submitted nor approved.

Comment: Inflow should equal outflow during a drought.

Response: In a project with no useable storage, inflow always equals outflow. According to the Preliminary Application Document, SML holds 1,160,000 acre feet of water when full. Storage in reservoirs is used to meet beneficial uses at low flows and is replenished at higher flows. An important question before the SWCB is how much of the use of that storage is a reasonable use in balancing the wants and needs of the upstream and downstream stakeholders. Lake stakeholders frequently cite a one foot drop as a reasonable amount from their point of view. Such a decline represents only 1.8 % of the total storage of SML. A drop of five feet, which is more than lake would ever fall under a repeat of the 2002 drought, would use less than 8% of SML’s storage.

The previous license required a constant minimum of 650 cfs all year round. DEQ agreed that this constant release was inappropriate and in the drier months should be lower. HL-8, with flow targets that change by month, moves in the direction of a more natural minimum flow. DEQ does not agree that the extreme low flows should be identically matched. Many commenters suggest that there is something natural about the extreme low flows and because they are “natural” they should be good enough for a minimum release. At that extreme low end of the hydrologic regime which we experienced in July and August of this year, the inflow is not natural, but highly altered by upstream consumptive uses. Golf courses, turf farms, irrigated agriculture unreturned the river municipal or industrial withdrawals, and natural streams cut off by drawn down farm ponds, public water supply reservoirs and storm water ponds all reduce the “natural” low flow. Even TCRC is not suggesting that these inflows below 300 cfs should be all that should be released recognizing the environmental damage that these ultra low flows cause to aquatic life.

Regarding run of the river operation, DGIF said:”The Smith Mountain project has been in operation now for 45 years. Over this the time period the Roanoke River below Leesville Dam has been highly regulated and the result has been an altered stream channel and an altered fish population that has adjusted to the 650 cfs average weekly flow scenario. While many run of the river projects are beneficial to aquatic communities and often preferred, we believe that such a release protocol for the Roanoke River would be very detrimental to the aquatic life that has developed in the river over the 45 years that the Smith Mountain Project has been in operation.

In fact, habitat data collected during the instream flow study indicates that a run of the river operating protocol during period of low inflow would result in a 60 -90% loss of habitat below the Trigger 2 “floors” for most species. It is important to remember that Trigger 2 “floor” targets already represent significantly reduced habitat. In addition, there are several industries and power plants along this stretch of the river that could not function within their DEQ permits under such a water release protocol. Finally, when the Smith Mountain/Leesville project was created it impounded approximately 85 miles of stream to create two reservoirs which have a combined volume of nearly 400 billion gallons. The very definition of a reservoir is a place where water is stored for future beneficial use and need and certainly there is sufficient water available in the project to provide for a balance approach to water management in the lower Roanoke River.”

The target flows recommended by DGIF compare well with what are considered to be low flows (10th percentile). Looking at columns 2 and 3 below, DEQ analyzed the streamflow records at Brookneal before the project construction began (1923 to 1959) to get a good idea of what “natural” low flows would be. The table shows tenth percentile flows for each month, which means that ninety percent of the time streamflow would be higher than these values and 10 percent of the time they would be lower.

Low Flows at Brookneal (cfs)

Month	10 th percentile flow pre dam	DGIF’s trigger 1 and 2 targets (June-Nov) and all 3 targets (Dec – May)	10 th percentile flow (TCRC)	Difference between DEQ’s and TCRC’s 10 th percentile estimates
Jan	1058	990-990-770	950	118
Feb	1377	990-990-770	1150	227
Mar	1575	935-825-770	1300	275
Apr	1755	1275-1200-1050	1200	525
May	1277	1275-1200-1050	1200	327
June	888	765-765	610	278
July	652	595-560	425	227
Aug	545	570-570	310	235
Sept	367	550-550	300	67
Oct	505	570-570	400	105
Nov	671	595-565	550	121
Dec	841	720-720-560	675	166

There is a large difference between DEQ’s calculated pre dam 10th percentile flows and the values that TCRC estimates are the 10th percentile flows. Perhaps this was because the pre dam period was wetter. DEQ only used actual data taken at the Brookneal gage before the dam was built. Perhaps, TCRC synthetically derives natural 10th percentile flows from the OASIS model using pre and post dam periods or uses post dam altered flows in the data set.

The lake itself increases water loss especially in drought conditions. Summertime evaporation from the lake surface can be as much as 6 inches per month or an average of 175 cubic feet per second of water evaporating from a 20,600 acre lake. Even if exactly the amount of water that came in was released, the Lake would still fall half a foot per month or more, if we were in a drought. The half a foot per month estimate is based solely on evaporation and does not include

seepage. Seepage has not been directly measured but was estimated by the modeler to be as much as 300 cfs. If we maintained inflow equals outflow perfectly, the reservoir would still drop. Most commenters who were recommending inflow equals outflow, probably meant for the concept to apply to only to low flows and a portion of higher flows would be released and a portion retained so the reservoir could be restored after it was drawn down.

In reviewing the minimum releases and targets of HL8 and comparing those flows to natural lows flows, DEQ is in agreement that the targets are reasonable, appropriate and balanced because they are reflective of natural pre dam low flows and because they can be accommodated and still improve in lake levels.

Comment: Smith Mountain Lake is an important economic asset to the region and low lake levels reduce economic activity.

Response: According to the Executive Summary of the Socio-economic study, “The net fiscal impact of the project area on the study region was estimated by subtracting project area-related expenditures from project area-related revenue. The project area generated \$32.1 million in revenues, including property taxes paid on structures and lands in the project area, state and local sales and use taxes generated by spending by out-of-region visitors, other revenue generated at the local level, and a portion of the state and federal aid paid to the local jurisdictions in 2005. That same year, public expenditures associated with the project area totaled only \$18.8 million, yielding a net fiscal effect of \$13.4 million.”

“While Appalachian employed only 21 persons in 2005 at the Smith Mountain Lake Project, the project area’s contribution to the regional economy included as many as 3,230 jobs, accounting for \$89 million in earnings, at other businesses in the four-county study region in that same year”.

DEQ agrees that SML has been and continues to be economic asset to the area. DEQ agrees in principal that higher lake levels are better than lower lake levels for a tourist destination like SML, which is why DEQ has jettisoned the original license article in an attempt to hold lake levels at a higher level.

Comment: DEQ should adopt the Tri County Relicensing Committee position.

Response: The Executive Summary describing the TCRC position is presented in Appendix 2. DEQ first became aware of this TCRC position on August 20, 2008. TCRC provided DEQ clarifying documents on September 5, 2008. TCRC had representatives on the drought management work group but was not satisfied with the outcome and has offered this alternative.

Here is how TCRC describes their protocol:

1. Releases from Leesville follow Mead & Hunt inflows until minimum release floor is reached, unless
2. SML actual project level falls below 792' then the Leesville release drops to minimum release until actual project level returns to 792' ; unless
3. SML actual level drops to 791', then match Leesville release to project inflows (regardless of minimum release) until SML actual level returns to 791' ; then release minimum until SML actual level returns to 792'.
 - An alternative, consult prior to dropping releases below minimums

4. Winter recharge period between November and 15 April where releases, as needed, could remain at minimum release.

TCRC says that step 1 is how APCO currently operates. That is not correct. Currently APCO maintains a 650 cfs minimum release and releases more if the lake is full and inflows allow; algebraically:

If $(650 \text{ cfs} + \text{Losses}) > \text{Inflow}$, $\text{Release} = \text{Inflow} - \text{Losses}$

As flows drop, APCO maintains a minimum release of 650 cfs, and the lake begins to decline; algebraically:

If $(650 \text{ cfs} + \text{Losses}) < \text{Inflow}$, $\text{Release} = 650 \text{ cfs}$.

APCO doesn't actually have to measure inflows at all, nor do they have to estimate losses, they just make sure they release a minimum of 650 cfs.

TCRC offered (September 5, 2008) the following permit language,

"The permittee shall release water from Leesville Dam to equal the Meade and Hunt Inflow set as measured and calculated each day at 6:00AM EST. This daily variable release pattern shall continue unless the daily inflow set is equal to or less than the minimum monthly release and the actual level of Smith Mountain Lake falls to or below 792"

Meade and Hunt inflows are a function of the flow at gages on the Roanoke River, the Pigg River and the Blackwater River multiplied by individual coefficients. Hydrologics, the modeler for HL-8, estimated that the Meade and Hunt formula underestimates inflow to the project by 20%.

Despite what TCRC claims, this is not what APCO does now. In the June through October time period if Meade and Hunt inflow are less than 650 cfs but greater than 400 cfs, TCRC would release the Meade and Hunt inflow, but the APCO license would release 650 cfs under the current license. If Meade and Hunt inflow dropped below, 400 cfs TCRC would release 400 cfs; but APCO would release 650 cfs. By essentially reducing the minimum instream flowby requirement from 650 to 400 cfs, TCRC keeps the reservoir close to full over most of the summer.

If the reservoir falls more than one foot adjusted, TCRC would retain the minimum flowby of 400 cfs, as long as it did not fall two feet. Any inflows over 400 cfs, would not be released but would be used toward refill. If the reservoir fell more than two feet adjusted, we would go into variance mode similar to what we do now. In the past we have dropped more than two feet adjusted every other year. Under TCRC, it would happen only once every 5 years due to the fact that the new minimum instream flowby would maintain the lake in a much higher condition.

The TCRC proposal differs from HL-8 in a number of important ways.

- It is not risk based; triggers are based on levels only, not time of year.
- It uses new lower minimum flows than recommended by DGIF
- It does not use downstream tributary flows in deciding how much water to release
- It does not use adjusted elevation so rules could change intraday

HL-8 takes into account, inflow, lake level, time of year, day of week and the probability of the reservoir rising or falling based on the time of year in making a decision about how much water to release. If the project's elevation had only fallen one foot by the end of the entire summer, HL-8 would not have triggered lower releases, because such a decline is not out of the ordinary by that time of year and would likely soon be reversed. The TCRC proposal is a simpler plan in that it takes into account only lake level, Mead and Hunt inflows and new monthly minimum flows in deciding how much water to release. TCRC will trigger a minimum release whenever actual levels strike 792 feet, which is equivalent to an adjusted level of 794 feet or only one foot down.

By not using a risk based approach, there will be some false alarms when releases are reduced without strong reasons. Under the TCRC plan, modeling shows that 14 trigger 1 events, where the lake level drops one foot from full, do not happen until October or November. This is in a 78 year period of record. It should be noted that one of the reasons the lake stays at such a high level so often so late in the season is because the TCRC plan reduces the minimum release from 650 cfs to 400 cfs, even under normal circumstances. Lake levels are not particularly stressed by such a low minimum instream flow.

A comparison of TCRC minimum releases with 10th percentile flows and DGIF target flows and monthly flows is shown below. Because TCRC uses releases at the Leesville Dam rather than a target at Brookneal and because TCRC uses a single minimum release instead of multiple ever-decreasing targets this is somewhat an "apples to oranges" comparison below. The DGIF target flows at Brookneal have been adjusted downward to reflect the smaller drainage area back at Leesville Dam.

Flow Comparisons at Leesville Dam

Month	TCRC Minimum Release	Natural Low Flow Pre dam 10 th percentile	DGIF's target 1 and 2 Flows at Brookneal transferred to Leesville
Jan	500	653	607-607
Feb	625	870	607-607
March	725	1037	573-506
April	675	1158	920-782
May	500	777	920-782
June	400	546	469-469
July	400	380	365-343
Aug	400	365	349-349
Sept	400	250	337-337
Oct	400	360	349-349
Nov	350	440	365-343
Dec	350	523	441-441

Looking at the months March through June, the TCRC minimum release is much lower than natural low flows. The effect of these low minimum releases will insure that the lake stays full at least through June 30th. It is not until July, that TCRC recommended minimum flows approaches natural seasonal low flows. To their credit, the TCRC holds their recommended minimum release at 400 cfs in the five hottest and lowest flow months of July through October. These TCRC minimum flows are not that dissimilar to DGIF's Leesville equivalent target 1 and

2 recommendations. However the TCRC plan jettisons the minimum instream flow of 400 cfs if the lake drops two feet adjusted, so the TCRC minimum instream flow may be present in good times but might be meaningless in bad. Both plans are willing to drop minimum releases considerably below the natural low flows over the winter in order to refill the lake.

The TCRC release at Leesville is computed regardless of how downstream tributaries are flowing. HL-8 factors in side flows from the downstream tributaries in determining how much water to release. In an event like Tropical Storm Hannah which on September 6, 2008 passed downstream of the project, HL-8 would have reduced releases from Leesville because of all the rain that raised flow in the downstream tributaries. The TCRC plan would have released the same amount of water whether or not flow in the downstream tributaries rose. This is an important difference and when we are attempting to maintain lake levels while meeting downstream objectives as well, this lack of coordination between releases and tributary inflows is a detriment to meeting multiple conflicting objectives

The TCRC plan uses actual SML lake levels rather than the adjusted lake levels as triggers. Actual levels fluctuate by as much as two feet over the course of the day as the project releases to and then pumps back water from Leesville Lake. The TCRC trigger zones are only separated by one foot. Conceivably, APCO could be faced with complying with five sets of rules over the course of one day as the actual level fell from the normal zone to the trigger one zone to the trigger 2 zone and then rose back to the normal zone. It is not clear from the language offered by TCRC how APCO and DEQ would address permit compliance with rules that could change several times over the course of the day due to the pump back oscillation. HL-8 uses a trigger based on adjusted levels, which once tripped remains in place until either a more severe trigger is tripped or until the project recovers. Adjusted levels change very slowly, usually by no more than 0.04 feet per day so oscillating flowby rules are not an issue.

In summary, the TCRC plan essentially provides a new set of minimum releases at the dam, lower than the old minimum release of 650 cfs in all but 2 months. Under both plans the lake refills by spring. The spring minimum releases for TCRC in April and May are 675 and 500 cfs. In a dry spring HL-8 would try to augment flows to hit the Brookneal target of 1500 cfs. The TCRC plan could result in much less instream flow in these important spawning months. By abandoning probabilities, the TCRC approach does not do as good a job in meeting multiple conflicting objectives. Under the TCRC plan we could be go to lower releases at a relatively high lake level, when the calendar would predict a very high probability of higher flows and higher lake levels arriving soon. The TCRC proposal cuts off recreational releases completely once the actual level reaches 792 which is the equivalent of 794 feet adjusted or only one foot down. Declines of one foot down happened in 64 out of 77 years under the TCRC plan.

Graphs comparing lake levels and releases from Leesville Dam for the existing license, the existing license operated with variances from DEQ, HL-8 and the TCRC plan are shown in Appendix 3.

Comment: Leesville Lake is too full; APCO should be made to pump back daily all the water that can be pumped back from Leesville to Smith Mountain Lake.

Response: The purpose of the Project is to generate hydropower. When the electrical energy demand is low and there is “surplus” power available, APCO pumps back water to SML. Pumping water consumes energy. The potential energy thus stored is available for generating hydroelectricity the next time it is needed to meet peak demands. Because of the mechanical

inefficiencies involved in pumping water and in generating, there is a net loss of energy associated with the pump back/ regeneration process. The decision of when to generate and when and how much to pump back are a complicated set of economic and electrical engineering decisions that are integral to the original purpose of the project and should be left to APCO and the Independent System Operator charged with maintaining the electrical grid. APCO did make an effort to pump back water from Leesville prior to the Labor Day weekend. Due to the complexity of generation and load management, pumping back for holidays should be done on a good will basis by APCO.

Comment: DEQ should make APCO remove blockages from a canal that would allow passage around a reach of the Staunton River that is difficult to navigate at low flow. DEQ should make APCO provide additional public access to the Staunton River which in turn would allow shorter canoe trips that would not be all day affairs at low flow. Improving the recreational access and navigability of the Staunton River will in turn allow lower releases and higher lake levels

Response: DEQ is not opposed to these actions but does not feel that it is appropriate to require APCO to remove a blockage or provide a recreational amenity outside the Project boundary. FERC has a written guidance policy on settlement agreements which explicitly deals with such measures outside the project boundary. Although FERC is not opposed to such actions being put into settlement agreements, FERC will not require such actions of the permittee as a license condition. DEQ takes the same position. If such measures are taken, they should be part of a settlement agreement.

Comment: The permit should require Appalachian to surcharge the project in the spring.

Response: DEQ agrees. The modeling run, HL-8 included a small surcharge to the project equivalent of 795.3 feet adjusted. The permit does not contain language requiring a surcharge. DEQ will recommend to the Board that language requiring that APCO to the extent that inflows allow should build a surcharge to 795.3 by April 15 that will be released over the course of the Striped Bass spawning season.

Part II. Most Frequently Mentioned Downstream Comments

Comment: HL-8 is based on science and the input from professionals of the natural resources agencies.

Response: Comment noted. HL-8 is probability based with aquatic base flows recommended by DGIF and recreation flows recommended by DCR.

Comment: HL-8 does what the law requires by protecting and balancing instream beneficial uses with off stream uses.

Response: The comments refer to the paragraphs B and C of § 62.1-44.15:20 Virginia Water Protection Permit (see below) and the fact that both DCR and DGIF supported HL-8 and considered both upstream and offstream uses.

B. The Board shall, after providing an opportunity for public comment, issue a Virginia Water Protection Permit if it has determined that the proposed activity is consistent with the provisions of the Clean Water Act and the State Water Control Law and will protect instream beneficial uses.

C. Prior to the issuance of a Virginia Water Protection Permit, the Board shall consult with and give full consideration to the written recommendations of the following agencies: the Department of Game and Inland Fisheries, the Department of Conservation and Recreation, the Virginia Marine Resources Commission, the Department of Health, the Department of Agriculture and Consumer Services, and any other interested and affected agencies. Such consultation shall include the need for balancing instream uses with offstream uses.

Comment: Boating continues on the lake at all levels HL-8, whereas river boating stops at flows below 800 cfs, and canoeing is not possible at the low flows of HL-8.

Response: The type of recreation practicable on the river depends on the amount of water available. Motor boating may be possible in some reaches at high flows but is lost at lower flows and not at all possible in some reaches. As flows decline forms of recreation that require less flow remain. Canoeing, tubing, swimming and wading and bank fishing continue at lower streamflow levels. Canoeing through rapids and riffles may not be practicable if streamflow is less than 800 cfs as the commenters assert. Some type of recreation remains available on both the lake and the river at all of the lower flows and lower lake levels anticipated by HL-8.

Comment: Enact the Five Staunton River Watch Recommendations

Response: Responses to the five recommendations are itemized below.

Comment: There is a typographical error in the draft permit on the trigger one condition

Response: The typographical error will be corrected; unless the intended original trigger is changed by the Board.

Comment: The appropriate trigger model elevation for trigger 2 should be 789.5' (instead of 790') to greater equalize the negative recreational impacts on the riparian community. In exchange, in order to conserve water during the front end of dry periods when side flows are

anemic, the maximum release required outside of striper spawn should be capped at 700 cfs even under normal times.

Response: DEQ disagrees that the trigger should be lowered as this would delay implementation of water saving measures, which DEQ believes are already appropriate for balancing upstream and downstream interests. The second half of the comment, capping the minimum release at 700 cfs introduces a concept of a “maximum minimum”. DEQ has observed that when side flows are “anemic” releases necessary to hit the target at Brookneal can sometimes be larger than the minimum release by several hundred cfs. DEQ has also observed on the Staunton River in extreme low flow conditions the phenomena known in water resources as negative gain. Negative gain is when the flow gets lower as one moves downstream. Because HL-8 uses a comprehensive strategy which includes side flows and a target at Brookneal, DEQ agrees that capping releases may also be appropriate and will make a recommendation to the Board on potential modifications to the permit. The cap mentioned in the comment, 700 cfs may be an appropriate cap for the month of June because the target at Brookneal for June is 900 cfs, but a cap of 700 cfs in July when the target at Brookneal is 700 cfs, probably saves no water at all in the lake.

Comment: The permit needs to explicitly provide for river canoeing under Triggers 1 & 2 not only on weekends (as it does), but on the legal holidays of Memorial Day, July 4th, and Labor Day.

Response: DEQ agrees and will recommend this change to the SWCB.

Comment; Should trigger 3 ever persist through a spring season (as the model projects it would have in 1981 & 2002), weekly 12 hour recreational releases of 650 cfs should be made from the end of striper spawn through Labor Day for Saturdays only, plus Memorial Day, July 4th, and Labor Day

Response: The trigger 3 targets for April and May are much higher than the amount identified as necessary for canoeing. Modeling shows that the reservoir refills by June 1st even in the worst drought so this recommendation is not necessary. Trigger 3 conditions will hasten refill and also allow the declaration of emergency variances so that we can refill the Lake.

Comment: The minimum release needs to be continuous. (Note: This condition was supported by both sides)

Response: APCO has presented information that estimates that the cost of spilling water continuously would be equivalent to \$2,753,000 in lost energy. APCO estimated the capital cost of replacing a turbine with a variable speed propeller turbine would be \$1.5 million but this would also involve a loss of generation equal to an annual energy loss of \$2,014,000. APCO estimated the capital cost to replacing a turbine with an adjustable blade turbine at \$4 million. This alternative would be more efficient in recouping lost energy. Annual cost of energy loss for this option is estimated to be \$427,000.

DEQ has put a condition in the draft permit to increase the frequency of auto cycling. A study by APCO showed that increasing the frequency of auto cycling reduced the magnitude of the fluctuation and the extent to which the fluctuation extended downstream. Fluctuations will be negligible six miles downstream with one hour auto-cycling. With two hour auto-cycling fluctuations are detectable 11.7 miles downstream.

DEQ will recommend to the Board that a monitoring condition be added to the permit to determine if erosion is ongoing before taking these mitigating measures.

Comment: HL-8 results in higher lake elevations than previous release protocols and lower minimum releases so the downstream community is losing water under the proposed permit compared with the old license

Response: The difference in lake levels between an HL-8 based permit and the original license is very significant. Over the last 18 years, under the original license, the adjusted level would have been below 790 feet 12% of the time and below 786 feet 5% of the time. Under HL-8 the adjusted level is never below 790 feet adjusted over the same period.

HL-8 also produces higher lake levels than have been produced with variances but the differences are not significantly higher. The upstream stakeholders are not satisfied with the performance of the variance procedure and are seeking higher lake levels. Graphs comparing the performance of the various plans are shown in Appendix 3.

Comment: Smith Mountain Lake enjoys much less fluctuation than many other large lakes. Smith Mountain Lake residents should do what other lake users around the State do to adapt to fluctuations, such as building piers and floating docks, moving boats from shallow lots to trailers and using ramps, using floating docks, mooring offshore and extending boat ramps.

Response: DEQ previously addressed the boating access question and potential remedies.

DEQ agrees with the comment that compared to other lakes, SML fluctuation is limited but notes that each lake is unique. Claytor Lake does not fluctuate as much as SML, but Claytor Lake has a much larger drainage area and much smaller storage volume. Declines are not a problem because the lake refills easily. Lake Chesdin has the same swift refill attributes thanks to a relatively large drainage area and small amount of storage. Lake Anna has dropped as much as six feet, but is extremely difficult to refill due to its small watershed. Lake Moomaw is frequently mentioned as a lake with large fluctuations. Lake Moomaw was designed to drawdown severely. Lake Moomaw has a large minimum water quality release that benefits the entire Jackson and James River. The water quality release goes up in the summer, just the opposite of natural flow which exacerbates the decline. The lake has long boat ramps that remain serviceable during the drawdown. Lake Philpott, with a small watershed, also declines severely, due to water quality and hydropower releases. However, Philpott and Moomaw are not surrounded by private land and the draw downs while not welcomed are at least tolerated.

Kerr Lake is most similar to SML, due to the fact that both lakes are large upstream reservoirs in multi-lake hydropower systems. Roanoke Rapids Lake and Leesville Lake are the small downstream lakes in each system, and as receptacles for peak power releases have large daily fluctuations. The downstream lakes have minimum instream flow releases that sustain the natural river downstream. The minimum releases that sustain the lower Roanoke River and Staunton River draw down, not the downstream lakes, but the two large storage reservoirs furthest upstream, SML and Kerr Lake. The guide curve on Kerr Lake which shows the drop from full pond in a normal year declines 6.5 feet between spring and fall, considerably more than SML would decline in a normal year.

Several commenters said that because SML is highly developed it should not fluctuate more than the highly developed Lake Gaston. Lake Gaston is not comparable to SML because it is situated in series between Roanoke Rapids and Kerr Lake and merely passes through to Roanoke Rapids Lake whatever water is released out of Kerr Lake. As such Lake Gaston never fluctuates more than two feet.

Comment: Groundings occur at all levels and can be avoided by competent mariners, which should include the marine fire department. Reckless boating and alcohol play as much a role in accidents as groundings.

Response: Groundings and accidents are discussed in our response regarding public safety. It is true that groundings occur at all levels and that knowledge of local waters reduces the chances of groundings. It also seems to be common sense that groundings would increase at lower lake levels, but we have limited data to prove it.

Comment: Run of the river is not an appropriate release at because, due to erosive fluctuations the river banks have eroded and the river is now wider and shallower. Guaranteed minimum flows should be provided as mitigation for the riverine damage the project has caused. The dam has blocked fish passage, reduced overall flow as a result of lake evaporation and inundated hundreds of miles of river and stream.

Response: Run of the river is addressed previously.

Appendix 1

SML Marine Fire Department Comments (reprinted as received)

Purpose:

The purpose of this Operational impact plan is to disseminate information relative to the effects of the water levels of Smith Mountain Lake and their direct effect on the operations of Smith Mountain Lake Marine Volunteer Fire/Rescue.

Background:

When the lake was created roads were severed, what did take 1 minute to reach now can takes 1 hour, that and several fires were the reason for the inception of the Smith Mountain Lake Marine Volunteer Fire Rescue. Created in 1974 and Chartered in 1975 the start of a great Fire Company began. With only personal boats and donated boats, we began to put together a fire protection plan for Smith Mountain Lake. Now we operate some of the finest ISO rated Fireboats in the Nation.

During 1986 one of our now Lifetime members, Dick Lewis, had the idea of getting our Fire Company ISO rated to reduce the Insurance premiums for the Smith Mountain Lake residents. No total Marine Fire Company had ever achieved this before in the Nation. After a year of work with the Insurance Services Office, Inc. "ISO" during 1987, we received an ISO rating of Class 7 for the area within 1000ft of the shoreline and within 5 miles from our Fireboat 11-7 stationed at what is presently the Virginia Dare Marina. This was the first total Marine Fire Company in the nation to receive any type of rating. The next step was to purchase another fireboat to meet these standards, which took 10 years for us to be able to raise the money so in 1997 we put into service Fireboat 11-6 stationed at Smith Mountain Dock and extended our Class 7 ISO Rating. During 2001, we were able to extend our Class 7 ISO Rating again with a Fireboat stationed at Crazy Horse Marina on Blackwater this tied all three areas together and is where we stand now.

During the past 30 years of operations on Smith Mountain Lake we have run 1000s' of calls all with volunteers. During those years, we have protected the environment by performing Haz-Mat when we have Gasoline leaking, oil leaking, fuel tanks coming down stream from floods spilling Diesel fuel or Vehicles wrecking near the water spilling Haz-mat material in, or the proximity of the lake. We have worked Fires, boat accidents, searched for missing persons, assisted stranded boaters, done CPR, transported hundreds of injured victims, removed people from harms way, recovered airplanes from the lake, assisted the Game Wardens, Sheriff Departments, State Police, County Public Safety Offices and many more. A 100% volunteer force worked all these calls and more.

Our duties over the past 32 years have grown and changed as the lake has developed and grown. 32 years ago, we probably ran 15 calls per year and were limited on the types of calls. Now we run Fire as always but are licensed EMS also, and operate our own Dive Team. What this means is that we provide more services to the lake and its residents but also it takes a 100 times more money to operate. Our fuel bill used to be less than \$400. Per year, fuel costs in 2005 hit \$30,000 and 2007 it is over \$40,000..

As of July 2006, the Smith Mountain Lake Marine Volunteer Fire / Rescue / Dive Team serves a population of approximately 18,000 full time residents living around Smith Mountain Lake within the SMLMVF/R recognized Fire District. Our fire district covers approximately 132 square miles, including the water and land, which we provide services. During the tourist season, our research shows this number quadruples putting us with approximately 54,000 in our protection area.

During 2007 we were dispatched to 372 Emergency calls and with these response number increasing annually

A few call Types during an Avg. Year

Structure Fires	27
Boat Fires	21
Brush Fires	17
Rescue	51
EMS	29
Haz-mat	46

The growth of Smith Mountain Lake has been astronomical over the past several years and is slated to be even greater in the future.

RESPONSE OF

The response of the Fire / Rescue / Dive of the SMLMVF/R is an all-volunteer response, from the Chief to the new recruit. Our department responds to calls 24 hours a day 365 days a year including Christmas and New Years when we usually have calls.

SMLMVF/R crews work shifts from Friday night through Sunday evening with all volunteer crews. The department started working weekend shifts almost four years ago and it has cut our response time 80% in marking in route to dispatched calls. The crew schedules are Friday 5:30pm to 11:30pm, Saturday Noon until 11:30pm and Sundays noon until 5:30pm we also keep crews on holidays. Normal staffing is a three person crew consisting of a Firefighter an EMT or higher and a Rescue Diver. Many of our members are crossed trained meaning they are FF-EMT or FF-Rescue Diver or have all three Disciplines as a FF-EMT-Rescue Diver we even have a FF-Paramedic-Diver.

Strategy and Criteria

The objective of the Smith Mountain Lake Marine Volunteer Fire / Rescue is providing Fire and EMS coverage to the entire Lake Community within a reasonable response time. Though it is desirable to provide this level of service throughout our community, such service would be beyond budgetary constraints. In establishing realistic criteria or warrants for future expansion of services actual needs will be the driving force behind the decision.

Our research has revealed:

1. For every 15 houses built approximately one call per year is generated
2. In multi family structures, for every 45 residents, one call per year is generated
3. As developments mature, call volume increases
4. As population of a specific area ages, medical call demand increases

5. High density housing has the greatest impact on call volume
6. For every call increase on land, we estimate creates the same increase on the water so our volume increases even at a greater rate

Present:

Smith Mountain Lake has the largest total Marine ISO RATED Volunteer Fire Company in the Nation. We are very proud of that and being involved with providing these services to our community. All of our volunteers could be out working or spending time with their families but they are dedicated to helping others with every spare minute they have. Thanks to all of these Volunteers, the water is cleaner and safer for all who come to or live on Smith Mountain Lake. We provide Fire and EMS coverage for all who are on or near Smith Mountain Lake.

Operational Impacts:

The impacts of low water levels on Department operations include: (All levels are ACTUAL lake water levels.) Note: These impacts exist whenever the actual lake level is at these levels, whether due to low in-flows, power generation, or transient operations. Fireboats have run aground when the lake level has dropped while the boat is on an emergency call, especially at night.

Above 793.0 No adverse impacts

Below 793.0 Use caution

Below 792.0 Use extreme caution, especially at night, near known shoals, in coves, near shore
Longer response times due to circumnavigating shallow areas
Tie fireboats to outside floaters as necessary, where boat slips are shallow
Capability to fight structural and brush fires near shoreline degraded.

Below 791.0 Response times degraded for many reasons now, lives of the public and Public Safety personnel at a great risk traveling and approaching Emergency Scenes.

1. Extension of now marked Shoals can reach 100 yards into channel
2. Creation of hundreds of new Unmarked Shoals.
3. Day time operations seriously effected by Low Water conditions
4. Some areas can't reach docks must ground a fireboat to lay fire hose or reach Rescue victims.
5. Wet hydrants becoming un-operational due to being out of the water or the water is so shallow that a whirlpool is formed letting the pumps get on air or we call cavaiaon.
6. Fireboats damage pumps due to sucking materials through pump while having the bow grounded on shore.
7. Many preplans can not be executed as planed due to low water conditions
8. Cabled boatlifts while being lowered must travel a greater distance due to water levels down.
9. Fireboats must be taken out of covered lifts and store at open docks
10. Fireboats within boat houses with airlifts need moved due to lift tubes hitting the bottom
11. Rescues become extremely hard in many situations due to low water.

12. Grounding of boats, especially at night, rises putting our Fire Crews covering more calls and having more high risk time on the water due to low water conditions.

Below 790.0 Fire / Rescue Service providers, SMLMVF/R are at extreme risk anytime they operate on the lake at this level. Times are extended for response and provision of Fire and Medical Services

1. All above impacts become amplified.
2. Extension of now marked Shoals can reach 125 yards and more into channel
3. It is not just hundreds of Shoals now you have lots of Islands beginning to form with Unmarked shoals around every one of them.
4. All Fire / Rescue operations are affected by these low water conditions
5. Areas of the lake that users have always Skied, boated and used safely now produce Serious Safety Risks.
6. New users of the lake are not aware of such dangers since there are no MARKINGS to indicate caution in shallow areas.
7. Water supply for all 9 Fire Departments surrounding the Lake is at risk with homes as far away as 5 miles from the lake depend on our Fireboats to supply water to their tankers.
8. ALL operations of the Fireboats must slow down due to the extreme amount of hazardous conditions all personnel are exposed to.

Summary: All Smith Mountain Lake Marine Volunteer Fire/Rescue members are highly trained and dedicated volunteers. We take our mission of protecting life and property on and near Smith Mountain Lake seriously. Since our founding in 1975, AEP has consistently supported this organization and recently recognized the importance of our mission by providing water front property for a training center and office complex for our Department. Our volunteers deserve our full support for their Safety and yours. We can do no less.

Thank you for this opportunity to express our concerns on these issues.

Appendix 2
TCRC Executive Summary

TCRC Comment

on

Joint Permit Application Number 08-0572

Clean Water 401

Smith Mountain Project

20 August 2008

Executive Summary

The purpose of this submittal is to comment on the Joint Permit Application Number 08-0572 for the Smith Mountain Project. The Tri-County Relicensing Committee (TCRC) represents the interests of four Counties (Bedford, Campbell, Franklin and Pittsylvania) and their 260,000 residents. The TCRC has actively participated in the relicensing of the Smith Mountain Project and been intimately involved in all aspects of Study Plan Development, Study Report Analysis, Management Plan Development and License Application review. Additionally the TCRC has been involved in Appalachian Work Group Meetings.

This submittal is organized in Sections. Section 1 discusses TCRC's objectives and recommendations for a balanced water release protocol. Section 2 is a review of the Instream Flow Needs Study including a discussion of limitations and issues that require careful consideration when interpreting its results. Section 3, explores other factors that may influence release protocol design. Section 4 discusses the Virginia Department of Game and Inland Fisheries (VDGIF) recommendations and its endorsement of the Hydrologics HL_8 release protocol (the foundation for Permit 08-0572). Section 5 comments on the Virginia Department of Conservation and Recreation (VDCR) recommendations and its endorsement of HL_8. Section 6 comments on the Virginia Department of Environmental Quality (VDEQ) recommendations and its analysis of HL_8.

Unfortunately past operations and those proposed for the next license under Permit 08-0572 have not and will not operate for the benefit of the river. Peaking releases from Leesville prior to 1988 did harm to the river, negatively impacting river fishery and river recreation. Since 1988, autocycle operation at Leesville has improved the situation, but even greater benefits could be realized if the licensee would agree to a continuous release from Leesville, one that closely mimics the natural river flows. TCRC's recommendations for a balanced release protocol are guided by the following objectives.

1. **Provide for adequate public drinking water supplies--** The Roanoke River Basin is designated within VA DEQ's database as DWS or Drinking Water Supply. This is the highest and best use for the resource within the basin and is needed to support future economic growth and development. Estimates from localities in the basin and regional planning agencies projected that an average withdrawal of 24.9 MGD would be needed to support an expanding population and associated economic development in the basin by the year 2040. The HL-8 simulation models an average water withdrawal of 12.5 MGD, which assumes that 50% of the withdrawal will be returned to the basin. Considering the rural economies of the area, this assumption may not be realistic as evidenced by the lack of public sewer facilities. The fact HL_8 doesn't model the higher withdrawal limit means that the localities will have to finance additional studies before applying to the FERC and VA VDEQ for any increased withdrawal above 12.5 MGD.

TCRC recommends the permit model the 24.9MGD average daily withdrawal.

2. **Protect the public safety within the project --** Appalachian's proposed release protocol (HL_8) offers no improvement to project levels, especially during periods of protracted low inflow, and is merely a continuation of historic operations since 2000. Unfortunately, VA VDEQ, DGIF and DCR staffs have taken the position that project levels are safe and fairly balanced with releases, but offer little supporting evidence.

TCRC recommends project out flows be managed to ensure SML remains at or above 792 feet, with an expected probability of 90%. Minimum releases from Leesville should be set at: 400cfs (between June and October); 350cfs during November and December; and at the 10th percentile flow between January and May. In extreme situations (below the 10th percentile flow) TCRC recommends that variance provisions be included in the permit to reduce flows below these minimums, dependent upon river conditions, project levels, time of year, and /or other mitigating circumstances.

3. **Promote habitat and a healthy fishery in and below the project** -- Restoring the river to a more normal or natural flow regimen offers the best possible protection for downstream river habitat. A minimum release floor should be established to protect the river from extreme low water events (i.e. flows below the 10th percentile of the hydrologic record for a given month). Even though this may deviate from a pure natural or run-of-river flow regimen, there are water withdrawal permit holders below the project that require access to flows. The results of the Instream Flow Needs Study, contrary to VDGIF's assessment of this study, clearly supports a more natural flow regime as this regimen benefits most species in the river.

TCRC strongly recommends that autocycle operations halted and replaced by a continuous release that mimics the natural flow at Leesville. TCRC recommends the fishery in the Staunton River between Leesville and Altavista be sampled yearly so empirical data is available for adaptive management decisions every five years or when the release protocol is revisited. TCRC recommends other reaches of the Staunton River, suitable for Roanoke Log Perch, be sampled yearly for evidence of restoration.

4. **Augment flows for downstream recreation while also protecting public access to the waters of SML for recreation** -- Equitably balancing recreation in and below the project is a natural outgrowth of a more natural flow regimen. The project's releases should follow the simulated hydrograph at Leesville (as if the project were not in place). Additional augmentations in release for downstream recreational enhancement are possible when project levels are at or above safe levels, and when supplemental flows are needed / requested.

TCRC wants to see public access expanded along the Staunton River and scenic river segments. Historic century old navigation enhancements should also be cleared and maintained of free of debris to enhance canoe recreation under most flow conditions.

Results of the Instream Flow Study should be analyzed within the context of the basin's natural hydrograph. Flows in the basin vary significantly by season. Median flows in the high flow months between January and April are two to three times higher than the median of the low flow months between July and October. Native species in the river fit well with this natural flow pattern. Those species preferring higher flows for spawning, spawn during early spring and species preferring lower flows, spawn during the late spring and early summer. Larger adult predators like walleye and striped bass leave the river after spawning to return to the deeper and cooler waters of Kerr Reservoir. The remaining species prefer low to moderate flows for success of fry and juveniles. Adult species prefer moderate flows.

In years when flow patterns are higher, those species that prefer higher flows benefit while species preferring lower flows are inhibited. During low flow years the results are the opposite. Consequently to sustain its diverse ecosystem, the river

must naturally experience both high and low flows. Regulating flows so that low flows do not occur during summer months results in a permanent alteration (loss) of modeled habitat for those species and life stages that prefer low to moderate flows.

The proposed HL_8 protocol relies on water stored in the project to augment river flows during summer months to ease low flow conditions, permanently altering (reducing) modeled habitat for most species in the river during the summer, to benefit canoe recreation through a limited reach of river. Substantial flow augmentation for extended periods causes project levels to fall throughout the low flow months to levels that limit recreational access and increase safety risks for both visitors and residents. In order to refill the project, project releases are then restricted during the high flow months of February and March; so this pattern can begin again. Table 6.0 below clearly illustrates this altered pattern.

	Project Augments Flows	Project Neutral Flow	Project Restricts Flow	Project Drawdown
Jan	25%	55%	20%	-5%
Feb	11%	19%	70%	59%
Mar	2%	10%	88%	86%
Apr	12%	81%	7%	-5%
May	40%	50%	10%	-30%
Jun	60%	35%	5%	-55%
Jul	77%	20%	3%	-74%
Aug	90%	10%	0%	-90%
Sep	75%	25%	0%	-75%
Oct	55%	45%	0%	-55%
Nov	20%	77%	3%	-17%
Dec	25%	75%	0%	-25%
Table 6.0 -- HL-8 Regulation Alters Natural Flow				

This regulated approach reduces natural flow variation in the lower river to benefit recreation and negatively impacts project recreational access and public safety.
"Managing a river to maintain minimum water flow or sustain a single "important species" is like teaching pet tricks to a wolf: The animal may perform, but it's not much of a wolf anymore." {**Natural Variability Is Key To River Restoration, Roger Segelken, Cornell University**}